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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/763,554

01/23/2004

Hirokazu Honda

NEC 26485

7561

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HAYES SOLOWAY P.C.  
3450 E. SUNRISE DRIVE, SUITE 140  
TUCSON, AZ 85718

EXAMINER

WILLIAMS, ALEXANDER O

ART UNIT

PAPER NUMBER

2826

MAIL DATE

DELIVERY MODE

06/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/763,554	<b>Applicant(s)</b> HONDA, HIROKAZU	
	<b>Examiner</b> Alexander O. Williams	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-20 is/are pending in the application.
- 4a) Of the above claim(s) 10-15, 18 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-9, 16, 17 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/10/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

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Serial Number: 10/763554 Attorney's Docket #: NEC 26485  
Filing Date: 1/23/2004; priority to 2/3/2003 and 12/10/2003

Applicant: Honda

Examiner: Alexander Williams

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/5/08 has been entered.

Applicant's Amendment filed 6/5/08 to the election of the species I, figures 1a, 1b, 8a-8h and 12a (claims 1-9, 16-18 and 19), filed 9/26/05, has been acknowledged. As of this action, claims 18 and 19 are now withdrawn.

This application contains claims 10-15, 18 and 19 drawn to an invention non-elected without traverse.

Claims 2 and 3 have been cancelled.

The indicated allowability of claim 5 is withdrawn in view of the newly discovered reference(s) to Baba Mikio in view of Ryoichi. Rejections based on the newly cited reference(s) follow.

Claims 7 and 8 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 7, it is unclear and confusing to what is meant by "the stiffener being made of a different material from the second resin." The "second resin" is not mention to be of different material.

Any of claims 7 and 8 not specifically addressed above are rejected as being dependent on one or more of the claims which have been specifically objected to above.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-9, 16, 17 and 20, **insofar as claims 7 and 8 can be understood**, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Baba Mikio (Japan Patent Publication # 2001-244362 A) in view of Ryoichi (Japan Patent Publication # 6-61383).

1. Baba Mikio (figures 1 to 4) specifically figure 1 show a semiconductor device comprising: a semiconductor chip **2** mounted on a mounting substrate **1**; a first resin **6** filling a gap between the semiconductor chip and the mounting substrate; a stiffener **5** surrounding the semiconductor chip, the stiffener being adhered to the mounting substrate with a first adhesive **4**; and a second resin **7** partially filling a space between the semiconductor chip and the stiffener in contact with the first resin, the first resin being different in a thermal expansion coefficient from the second resin. Mikio fail to explicitly show a second resin

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filling a space between the semiconductor chip and the stiffener in contact with the first resin.

Ochiai Ryoichi is cited for showing a semiconductor device. Specifically, Ryoichi (figures 1 to 3) specifically figure 2 discloses a semiconductor device comprising: a semiconductor chip **2** mounted on a mounting substrate **1**; a first resin **21** filling a gap between the semiconductor chip and the mounting substrate; a stiffener **1** surrounding the semiconductor chip, the stiffener being adhered to the mounting substrate with a first adhesive; and a second resin **22** filling a space between the semiconductor chip and the stiffener in contact with the first resin, the first resin being different **(being different is interpret to means not the other)** in a thermal expansion coefficient from the second resin for the purpose of enhancing a flip chip device in heat dissipating properties and an inter-pad connection between the flip device and a ceramic package in reliability.

4. The semiconductor device as claimed in claim 1, the combination with Ryoichi show wherein the first resin includes an underfill part filling the gap between the semiconductor chip and the mounting substrate, and a fillet part extended from a region of the semiconductor chip.

5. The semiconductor device as claimed in claim 1, the combination with Mikio show wherein the first adhesive is larger in a thermal expansion coefficient than the second resin.

6. The semiconductor device as claimed in claim 4, the combination with Mikio show wherein the second resin **22** is in contact with inner walls of the stiffener **1**, the fillet part **21**, the mounting substrate **1** and each of side faces of the semiconductor chip **2**.

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7. Baba Mikio (figures 1 to 4) specifically figure 1 show a semiconductor device comprising: a semiconductor chip **2** mounted on a mounting substrate **1**; a first resin **6** filling a gap between the semiconductor chip and the mounting substrate; a stiffener **5** surrounding the semiconductor chip, the stiffener being made of a different material from the second resin; a second resin **4** filling a space between the semiconductor chip and the stiffener in contact with the first resin, the first resin being different in a thermal expansion coefficient from the second resin; and a lid **9** for covering the stiffener and the semiconductor chip, wherein the lid is bonded to the stiffener and a backside of the semiconductor chip with an adhesive. Mikio fail to explicitly show a second resin filling a space between the semiconductor chip and the stiffener in contact with the first resin.

Ochiai Ryoichi is cited for showing a semiconductor device. Specifically, Ryoichi (figures 1 to 3) specifically figure 2 discloses a semiconductor device comprising: a semiconductor chip **2** mounted on a mounting substrate **1**; a first resin **21** filling a gap between the semiconductor chip and the mounting substrate; a stiffener **1** surrounding the semiconductor chip, the stiffener being adhered to the mounting substrate with a first adhesive; and a second resin **22** filling a space between the semiconductor chip and the stiffener in contact with the first resin, the first resin being different **(being different is interpret to means not the other)** in a thermal expansion coefficient from the second resin for the purpose of enhancing a flip chip device in heat dissipating properties and an inter-pad connection between the flip device and a ceramic package in reliability.

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8. The semiconductor device as claimed in claim 7, the combination with Mikio show wherein the second resin **22** is in contact with an inner wall of the lid.

9. The semiconductor device as claimed in claim 1, the combination with Mikio show wherein an elastic modulus of the second resin **22** is larger than an elastic modulus of the first resin **21**.

16. The semiconductor device as claimed in claim 1, the combination with Mikio show wherein the stiffener (**outer portion of 5**) is made of a material selected from the group consisting of Cu, SUS, Al, alumina, silicon, aluminum nitride, and resin.

17. The semiconductor device as claimed in claim 1, the combination with Mikio show wherein each of the first resin **21** and the second resin **22** essentially contains a resin selected from a group consisting of **epoxy**, polyolefin, silicon, cyanate ester, polyimide, polynorbornene resins.

20. The semiconductor device as claimed in claim 1, the combination with either reference showing wherein the semiconductor chip is mounted on the mounting substrate through flip chip bonding.

Therefore, it would have been obvious to one of ordinary skill in the art to use Ryoichi's second resin to modify Mikio's second resin for the purpose of enhancing a flip chip device in heat dissipating properties and an inter-pad connection between the flip device and a ceramic package in reliability.

## **Response**

Applicant's arguments filed 6/5/08 have been fully considered, but are not found to be persuasive view of the new grounds of rejections detailed above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O. Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30AM-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272 1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AOW  
6/19/08

/Alexander O Williams/  
Primary Examiner, Art Unit 2826